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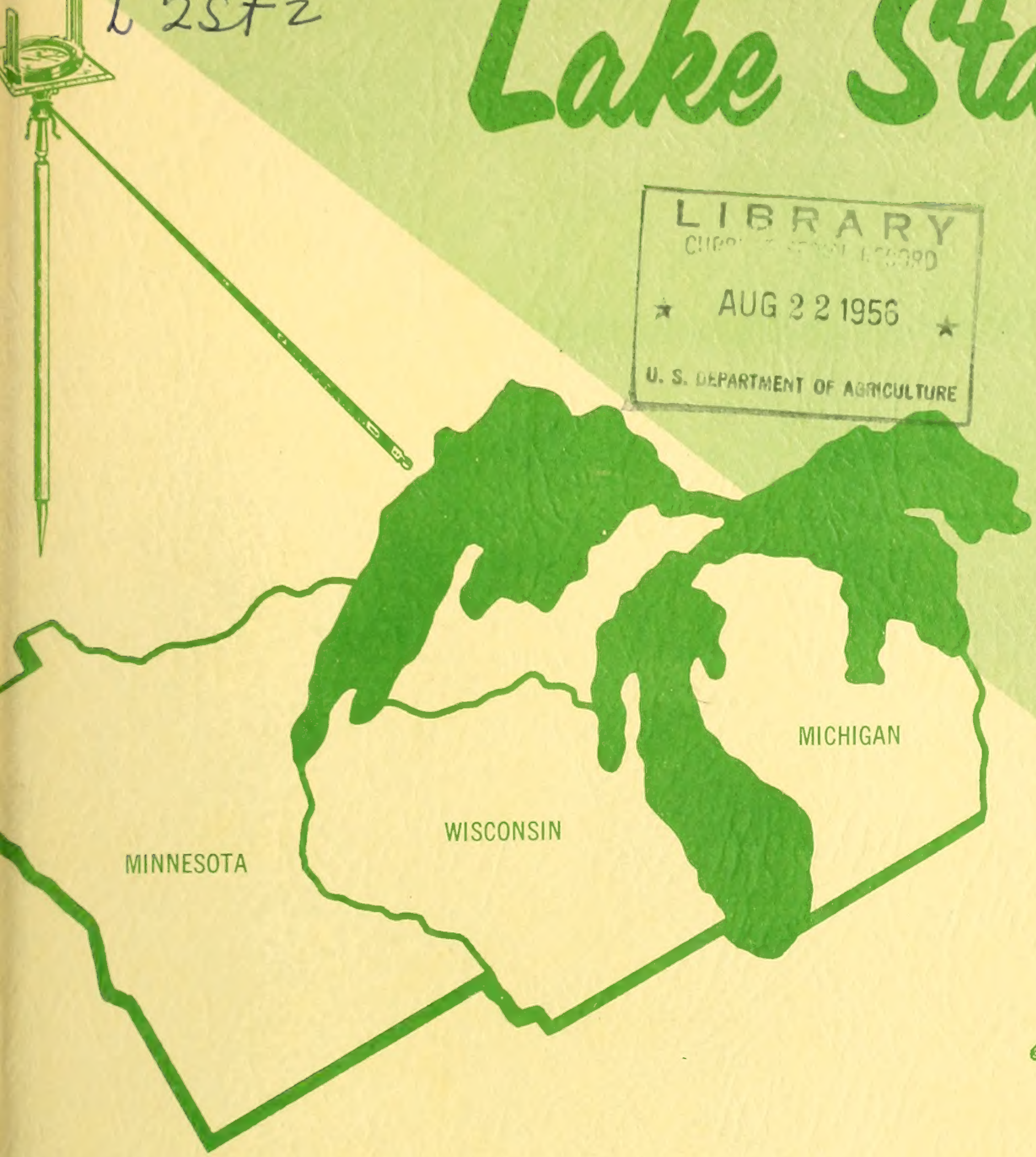

Timber Resources

LAKE STATES FOREST EXPERIMENT STATION
FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE

3 LAKE STATES

TIMBER RESOURCES

by

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R. N. Cunningham and Survey Staff*

7b Station Paper No. 37

5 July 1956

7a Lake States Forest Experiment Station

7 (U.S. Forest Service, U. S. Department of Agriculture

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* Preparation of timber resource data for the Lake States was a staff undertaking in which a large number of individuals participated. Among the major contributors were Clarence Chase, S. R. Gevorkiantz, Paul Guilkey, A. L. Hartong, Arthur Horn, James Morgan, Lucille Olsen, and Dean Quinney. Able assistance was received from men of the Office of Iron Range Resources and Rehabilitation, especially R. C. Keller and A. M. Vasilevsky.

FOREWORD

In 1952, the U. S. Forest Service began the latest of its periodic appraisals of the national timber situation. Preliminary results were announced in October 1955. This work is known as the TRR--Timber Resource Review.

Although a few field studies were made especially for the TRR, the main job was assembling the best information already available and then bringing it up to a common date--January 1, 1953. A large share of the data for Michigan, Minnesota, and Wisconsin came from the Forest Survey, a continuing project of the Lake States Forest Experiment Station[1/] in cooperation with other public and private agencies. Once this information was assembled for the national appraisal it seemed logical to publish the Lake States figures separately. As such they are a working tool for foresters and others interested in Lake States forest resources and their use.

The reliability of these figures varies with the completeness of the basic data and the size of the quantities reported. The Minnesota survey was practically complete at the time of the TRR. Minnesota estimates in this report have sampling errors of about 0.5 percent per million acres of commercial forest land and 1.0 percent per billion cubic-feet of growing stock. Wisconsin figures, for which the survey was not complete, are less accurate but still excel the TRR maximum error of 5 percent for area and 10 percent for volume. The accuracy of Michigan estimates is between those of Minnesota and Wisconsin.

As with all sampling surveys, small quantities are subject to greater error than large quantities. In these tables the totals are more accurate than the subtotals, and the subtotals more accurate than the individual items.

The information presented here is in the form of tables. These statistics supersede those in the bulletin "Forest Resources of the Lake States" published in 1950. No analysis or comment is made. The individual state reports of the Forest Survey, to be published later, will each include an analysis of the forest situation.

[1/] Maintained by the Forest Service, U. S. Department of Agriculture at St. Paul 1, Minnesota, in cooperation with the University of Minnesota.

The Lake States Forest Experiment Station coordinated the gathering of forest resource data. Much of the work was spread over the period 1946-53. It was conducted as a major project by the Conservation Departments in Michigan and Wisconsin, and in Minnesota by the Office of Iron Range Resources and Rehabilitation. Other federal and state agencies, counties, and private industries contributed too. Special assistance in computing was furnished by the American Box Board Company in Michigan, the Rhinelander Paper Company in Wisconsin, and the Blandin Paper Company in Minnesota.

The North Central Regional office of the Forest Service in Milwaukee gathered and summarized data on forest plantations and certain characteristics of mortality and ownership. In this they were assisted by the State Foresters and by private wood-using industries.

This report was put together by the staff of the Division of Forest Economics Research of the Lake States Forest Experiment Station.

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Table 1.--Land area of the Lake States by major classes of land, January 1, 1953 1/

(In thousand acres)

Land use	Total	Michigan	Minnesota	Wisconsin
Forest land:				
Commercial	53,272	18,849	18,098	16,325
Noncommercial:				
Productive--but reserved	718	272	428	18
Unproductive--reserved	32	5	7	20
Unproductive--unreserved	1,179	196	811	172
Total noncommercial	1,929	473	1,246	210
Total forest land	55,201	19,322	19,344	16,535
Cropland in farms 2/	40,680	9,061	20,901	10,718
Pasture and range: 3/				
In farms	11,881	3,084	4,178	4,619
Not in farms	-	-	-	-
Total	11,881	3,084	4,178	4,619
Other 4/	14,949	5,027	6,783	3,139
Total land area 2/	122,711	36,494	51,206	35,011

1/ For definitions of terms used in the tables, see Appendix.
2/ Source: 1950 Census of Agriculture.
3/ Exclusive of that in forest land.
4/ Farmsteads, roads, powerlines, urban, etc.

Table 2.--Commercial forest land area in the Lake States by stand-size class and state, January 1, 1953

(In thousand acres)

Stand-size class	Total	Michigan	Minnesota	Wisconsin
Sawtimber stands	6,457	2,556	2,017	1,884
Poletimber stands	16,010	5,411	5,281	5,318
Seedling and sapling stands	20,370	7,668	6,317	6,385
Nonstocked and other areas	10,435	3,214	4,483	2,738
Total commercial forest area	53,272	18,849	18,098	16,325

Table 3.--Commercial forest land area in the Lake States by stand-size class and degree of stocking January 1, 1953

(In thousand acres)

Stand-size class	Total	Well and medium stocked	Poorly stocked	Nonstocked and other areas
Sawtimber stands	6,457	3,167	3,290	-
Poletimber stands	16,010	7,884	8,126	-
Seedling and sapling stands	20,370	15,672	4,698	-
Nonstocked and other areas	10,435	-	-	10,435
Total commercial forest area	53,272	26,723	16,114	10,435

Table 4.--Commercial forest land area in the Lake States by ownership class and state, January 1, 1953

(In thousand acres)

Class of ownership	Total	Michigan	Minnesota	Wisconsin
Federal ownership or trusteeship:				
National forest	5,895	2,343	2,195	1,357
Indian [1]	1,119	23	717	379
Bureau of Land Management [1]	67	13	49	5
Other [1]	459	103	94	262
Total	7,540	2,482	3,055	2,003
State [1]	7,747	3,819	3,484	444
County and municipal [1]	6,152	86	3,619	2,447
Private:				
Farm	15,184	3,877	4,881	6,426
Wood-using industries [2]	3,039	1,447	578	1,014
Other	13,610	7,138	2,481	3,991
Total	31,833	12,462	7,940	11,431
All ownerships	53,272	18,849	18,098	16,325

[1] Because of different definitions of commercial forest land adopted by the Forest Service and other public agencies, acreage figures for these ownerships may vary from actual published commercial forest land acreages of the public agencies concerned.

[2] Includes lumber, pulp, and other wood-manufacturing industries.

Table 5.--Commercial forest land in the Lake States by ownership and stand-size class, January 1, 1953

(In thousand acres)

Class of ownership	Total	Sawtimber stands	Poletimber stands	Seedling & sapling stands	Nonstocked and other areas
Federal ownership or trusteeship:					
National forest	5,895	648	2,204	2,505	538
Indian [1]	1,119	205	382	293	239
Bureau of Land Mgt. [1]	67	4	19	21	23
Other [1]	459	47	122	203	87
Total	7,540	904	2,727	3,022	887
State [1]	7,747	461	2,304	3,037	1,945
County and municipal [1]	6,152	244	1,677	2,919	1,312
Private	31,833	4,848	9,302	11,392	6,291
All ownerships	53,272	6,457	16,010	20,370	10,435

[1] Because of different definitions of commercial forest land adopted by the Forest Service and other public agencies, acreage figures for these ownerships may vary from actual published commercial forest land acreages of the public agencies concerned.

Table 6.--Commercial forest land area in private ownership in the Lake States, and number of private owners by size-class of ownership and state, January 1, 1953

Ownership by size-class [1]	Total		Michigan		Minnesota		Wisconsin	
	Owners	Area	Owners	Area	Owners	Area	Owners	Area
	No.	M acres	No.	M acres	No.	M acres	No.	M acres
Under 100 acres [2]	441,909	15,773	158,702	5,301	123,431	4,168	159,776	6,304
100 to 499 acres	47,855	8,930	15,041	3,018	16,564	2,699	16,250	3,213
500 to 4,999 acres	2,010	1,677	610	562	548	329	852	786
5,000 to 49,999 acres	96	2,150	55	941	19	744	22	465
50,000 acres or more	20	3,303	14	2,640	[3]	[3]	6	663
All classes	491,890	31,833	174,422	12,462	140,562	7,940	176,906	11,431

[1] The size-class of each owner in each state was determined by the total commercial forest land that he owned in that state.

[2] Includes ownerships containing 3 to 99 acres of commercial forest land.

[3] Included in the 5,000 to 49,999-acre size-class to avoid possible disclosure of area held by individual owners.

Table 7.--Commercial forest land area in private ownership in the Lake States, and number of private owners by type of ownership and state, January 1, 1953

Type of ownership	Total		Michigan		Minnesota		Wisconsin	
	Owners	Area	Owners	Area	Owners	Area	Owners	Area
	No.	M acres	No.	M acres	No.	M acres	No.	M acres
Farm	371,329	15,184	126,642	3,877	101,298	4,881	143,389	6,426
All wood manufacturers	812	3,039	208	1,447	375	578	229	1,014
Other private	119,749	13,610	47,572	7,138	38,889	2,481	33,288	3,991
All ownerships	491,890	31,833	174,422	12,462	140,562	7,940	176,906	11,431

Table 8.--Commercial forest land area in private ownership in the Lake States, by size-class and type of ownership, January 1, 1953

(In thousand acres)

Type of ownership	All classes	Under 100 acres [1]	100 to 499 acres	500 to 4,999 acres	5,000 to 49,999 acres	50,000 acres and larger
All wood manufacturers:						
Lumber mfrs.	1,435	36	49	79	396	875
Pulp mfrs.	1,495	-	-	-	230	1,265
Other wood mfrs.	109	-	13	23	13	60
Total	3,039	36	62	102	639	2,200
Farm	15,184	9,859	4,961	364	-	-
Other private	13,610	5,878	3,907	1,211	1,000	1,614
All ownerships	31,833	15,773	8,930	1,677	1,639	3,814

[1] Includes ownerships containing 3 to 99 acres of commercial forest land.

Table 9.--Commercial forest land area in the Lake States by forest type and state, January 1, 1953

(In thousand acres)

Forest type	Total	Michigan	Minnesota	Wisconsin
White pine	414	160	142	112
Red pine	764	344	213	207
Jack pine	3,267	1,140	1,330	797
Spruce-balsam fir	4,111	1,298	2,094	719
Black spruce	2,947	574	1,952	421
Tamarack	1,273	264	699	310
Cedar	1,685	929	443	313
Northern hardwood	9,308	5,413	986	2,909
Oak	6,443	1,950	1,378	3,115
Elm-ash-cottonwood	4,609	1,225	1,869	1,515
Aspen	18,451	5,552	6,992	5,907
Total	53,272	18,849	18,098	16,325

Table 10.--Commercial forest land area in the Lake States by major forest types and stand-size classes, January 1, 1953

(In thousand acres)

Forest type	All stand sizes	Sawtimber stands	Poletimber stands	Seedling and sapling stands		Nonstocked area
				Satisfactorily stocked	Poorly stocked	
White pine	414	227	75	41	30	41
Red pine	764	233	143	205	85	98
Jack pine	3,267	238	949	1,015	445	620
Spruce-balsam fir	4,111	179	983	910	444	1,595
Black spruce	2,947	14	655	852	298	1,128
Tamarack	1,273	16	301	428	115	413
Cedar	1,685	97	467	496	146	479
Northern hardwood	9,308	2,321	2,303	3,042	437	1,205
Oak	6,443	1,690	2,005	1,364	556	828
Elm-ash-cottonwood	4,609	1,011	1,288	501	219	1,590
Aspen	18,451	431	6,841	6,818	1,923	2,438
Total	53,272	6,457	16,010	15,672	4,698	10,435

Table 11.--Net volume of all timber on commercial forest land in the Lake States by class of material, January 1, 1953

(In million cubic-feet)

Class of material	All species	Softwoods	Hardwoods
Growing stock:			
Sawtimber trees:			
Sawlog portion	8,765	2,534	6,231
Upper stems	1,957	613	1,344
Total	10,722	3,147	7,575
Poletimber trees	14,496	3,396	11,100
Total growing stock	25,218	6,543	18,675
Sound cull trees	920	92	828
Rotten cull trees	2,355	214	2,141
Hardwood limbs	1,667	-	1,667
Salvable dead trees:			
Sawtimber	16	5	11
Poletimber	13	4	9
Total (nongrowing stock)	4,971	315	4,656
Total, all timber	30,189	6,858	23,331

Table 12.--Net cubic-foot volume of growing stock on commercial forest land in the Lake States by class of material and state, January 1, 1953

(In million cubic-feet)

Class of material	Total	Michigan	Minnesota	Wisconsin
Sawtimber trees:				
Softwood	3,147	1,191	1,134	822
Hardwood	7,575	3,349	1,612	2,614
Total	10,722	4,540	2,746	3,436
Poletimber trees:				
Softwood	3,396	1,087	1,695	614
Hardwood	11,100	4,285	2,794	4,021
Total	14,496	5,372	4,489	4,635
Growing stock:				
Softwood	6,543	2,278	2,829	1,436
Hardwood	18,675	7,634	4,406	6,635
Total	25,218	9,912	7,235	8,071

Table 13.--Net cordwood volume of growing stock on commercial forest land in the Lake States by class of material and state, January 1, 1953

(In million cords)

Class of material	Total	Michigan	Minnesota	Wisconsin
Sawtimber trees:				
Softwood	39.3	14.9	14.1	10.3
Hardwood	94.8	41.9	20.2	32.7
Total	134.1	56.8	34.3	43.0
Poletimber trees:				
Softwood	42.5	13.6	21.2	7.7
Hardwood	138.6	53.5	34.9	50.2
Total	181.1	67.1	56.1	57.9
Growing stock:				
Softwood	81.8	28.5	35.3	18.0
Hardwood	233.4	95.4	55.1	82.9
Total	315.2	123.9	90.4	100.9

Table 14.--Net volume of growing stock on commercial forest land in the Lake States by species and state, January 1, 1953

Species	Total		Michigan		Minnesota		Wisconsin	
	Million cu.-ft.	Million cords	Million cu.-ft.	Million cords	Million cu.-ft.	Million cords	Million cu.-ft.	Million cords
Eastern softwoods:								
White and red pine	1,334	16.7	411	5.1	454	5.7	469	5.9
Jack pine	1,299	16.2	271	3.4	771	9.6	257	3.2
Spruce	1,173	14.7	350	4.4	732	9.1	91	1.2
Balsam fir	947	11.8	360	4.5	440	5.5	147	1.8
Hemlock	656	8.2	410	5.1	-	-	246	3.1
Tamarack	356	4.5	55	0.7	218	2.8	83	1.0
Cedar	778	9.7	421	5.3	214	2.6	143	1.8
Total softwoods	6,543	81.8	2,278	28.5	2,829	35.3	1,436	18.0
Eastern hardwoods:								
Soft hardwoods:								
Soft maple	1,181	14.8	733	9.2	46	0.6	402	5.0
Aspen	5,372	67.1	1,768	22.0	1,862	23.3	1,742	21.8
Basswood	1,008	12.6	283	3.6	297	3.7	428	5.3
Elm	1,527	19.1	727	9.1	353	4.4	447	5.6
Paper birch	948	11.8	348	4.4	416	5.2	184	2.3
Other soft hardwoods	857	10.7	275	3.4	261	3.2	321	4.0
Total	10,893	136.1	4,134	51.7	3,235	40.4	3,524	44.0
Hard hardwoods:								
White oak	1,113	13.9	375	4.7	287	3.6	451	5.6
Red oak	2,662	33.3	759	9.5	484	6.0	1,419	17.8
Yellow birch	598	7.5	371	4.6	15	0.2	212	2.7
Sugar maple	2,231	27.9	1,432	17.9	124	1.6	675	8.4
Beech	321	4.0	288	3.6	-	-	33	0.4
Other hard hardwoods	857	10.7	275	3.4	261	3.3	321	4.0
Total	7,782	97.3	3,500	43.7	1,171	14.7	3,111	38.9
Total hardwoods	18,675	233.4	7,634	95.4	4,406	55.1	6,635	82.9
All species	25,218	315.2	9,912	123.9	7,235	90.4	8,071	100.9

Table 15. Net volume of growing stock on commercial forest land in the Lake States by ownership class and state, January 1, 1953

(In million cubic-feet)

Class of ownership	Total	Michigan	Minnesota	Wisconsin
Federal ownership or trusteeship:				
National forest	3,199	1,119	1,367	713
Other federal [1]	1,069	64	402	603
Total	4,268	1,183	1,769	1,316
State [1]	2,953	1,511	1,213	229
County and municipal [1]	1,972	49	1,070	853
Private:				
Farm	7,651	2,283	1,992	3,376
Industrial and other	8,374	4,886	1,191	2,297
Total	16,025	7,169	3,183	5,673
All ownerships	25,218	9,912	7,235	8,071

[1] Because of different definitions of commercial forest land adopted by the Forest Service and other public agencies, acreage figures for these ownerships may vary from actual published commercial forest land acreages of the public agencies concerned.

Table 16.--Net volume of growing stock on commercial forest land in the Lake States by species group and diameter class, January 1, 1953

(In million cords)

Species group	D.b.h. class (inches)				
	Total	5.0-6.9	7.0-8.9	9.0-10.9	11.0 and larger
Eastern softwoods:					
White and red pine	16.7	1.4	2.0	2.6	10.7
Jack pine	16.2	4.9	5.2	3.2	2.9
Spruce	14.7	5.9	4.3	2.3	2.2
Balsam fir	11.8	4.7	3.8	2.1	1.2
Hemlock	8.2	0.4	0.8	1.0	6.0
Tamarack	4.5	2.2	1.4	0.5	0.4
Cedar	9.7	2.4	3.1	1.7	2.5
Total softwoods	81.8	21.9	20.6	13.4	25.9
Eastern hardwoods:					
Soft hardwoods:					
Soft maple	14.8	2.8	3.3	3.1	5.6
Aspen	67.1	21.7	20.6	13.9	10.9
Basswood	12.6	1.2	1.8	2.2	7.4
Elm	19.1	1.5	2.3	3.0	12.3
Paper birch	11.8	3.7	2.4	2.5	3.2
Other soft hardwoods	10.7	3.7	3.4	1.9	1.7
Total	136.1	34.6	33.8	26.6	41.1
Hard hardwoods:					
White oak	13.9	1.8	2.4	2.4	7.3
Red oak	33.3	4.3	5.3	5.9	17.8
Yellow birch	7.5	0.5	0.9	1.1	5.0
Sugar maple	27.9	3.1	4.1	4.4	16.3
Beech	4.0	0.4	0.3	0.4	2.9
Other hard hardwoods	10.7	1.9	1.9	2.5	4.4
Total	97.3	12.0	14.9	16.7	53.7
Total hardwoods	233.4	46.6	48.7	43.3	94.8
All species	315.2	68.5	69.3	56.7	120.7

Table 17.--Net volume of live sawtimber and net volume of salvable dead sawtimber on commercial forest land in the Lake States by state, January 1, 1953

(In million board-feet)

Stand-size class	Total	Michigan	Minnesota	Wisconsin
Live sawtimber:				
Sawtimber stands				
Softwood	7,743	2,930	2,531	2,282
Hardwood	23,241	10,481	5,204	7,556
Total	30,984	13,411	7,735	9,838
Other stands 1/				
Softwood	6,612	2,539	2,508	1,565
Hardwood	12,194	5,191	2,295	4,708
Total	18,806	7,730	4,803	6,273
All stands				
Softwood	14,355	5,469	5,039	3,847
Hardwood	35,435	15,672	7,499	12,264
Total	49,790	21,141	12,538	16,111
Salvable dead sawtimber:				
Softwood	24	9	8	7
Hardwood	45	20	6	19
Total	69	29	14	26

1/ Poletimber, seedling and sapling stands, and nonstocked and other areas.

Table 18.--Net volume of live sawtimber on commercial forest land in the Lake States by species and state, January 1, 1953

(In million board feet)

Species	Total	Michigan	Minnesota	Wisconsin
Eastern softwoods:				
White and red pine	5,015	1,504	1,716	1,795
Jack pine	2,083	308	1,421	354
Spruce	1,556	574	836	146
Balsam fir	1,141	502	504	135
Hemlock	2,735	1,695	-	1,040
Tamarack	300	51	167	82
Cedar	1,525	835	395	295
Total softwoods	14,355	5,469	5,039	3,847
Eastern hardwoods:				
Soft hardwoods:				
Soft maple	2,047	1,298	104	645
Aspen	3,958	1,234	1,927	797
Basswood	2,759	693	833	1,233
Elm	4,758	2,234	1,167	1,357
Paper birch	800	284	405	111
Other soft hardwoods	1,290	522	408	360
Total	15,612	6,265	4,844	4,503
Hard hardwoods:				
White oak	2,749	864	714	1,171
Red oak	6,745	1,979	1,218	3,548
Yellow birch	1,890	1,195	53	642
Sugar maple	6,080	3,904	261	1,915
Beech	1,068	943	-	125
Other hard hardwoods	1,291	522	409	360
Total	19,823	9,407	2,655	7,761
Total hardwoods	35,435	15,672	7,499	12,264
All species	49,790	21,141	12,538	16,111

Table 19.--Net volume of live sawtimber on commercial forest land in the Lake States by ownership class and state, January 1, 1953

(In million board-feet)

Type of ownership	Total	Michigan	Minnesota	Wisconsin
Federal ownership or trusteeship:				
National forest	5,652	2,100	2,433	1,119
Other federal [1]	2,538	126	579	1,833
Total	8,190	2,226	3,012	2,952
State [1]	4,368	2,292	1,687	389
County and municipal [1]	2,661	108	1,391	1,162
Private:				
Farm	17,061	5,207	4,485	7,369
Industrial and other	17,510	11,308	1,963	4,239
Total	34,571	16,515	6,448	11,608
All ownerships	49,790	21,141	12,538	16,111

[1] Because of different definitions of commercial forest land adopted by the Forest Service and the other public agencies, acreage figures for these ownerships may vary from actual published commercial forest land acreages of the public agencies concerned.

Table 20.--Net volume of live sawtimber on commercial forest land in the Lake States by species and diameter class, January 1, 1953

(In million board-feet)

Species	Total	D.b.h. class (inches)			
		9.0-10.9	11.0-14.9	15.0-18.9	19.0 and larger
Eastern softwoods:					
White and red pine	5,015	850	1,896	1,150	1,119
Jack pine	2,083	1,009	976	94	4
Spruce	1,556	688	611	185	72
Balsam fir	1,141	706	414	19	2
Hemlock	2,735	288	848	612	987
Tamarack	300	160	119	21	-
Cedar	1,525	529	696	216	84
Total softwoods	14,355	4,230	5,560	2,297	2,268
Eastern hardwoods:					
Soft hardwoods:					
Soft maple	2,047	-	1,108	570	369
Aspen	3,958	-	3,367	513	78
Basswood	2,759	-	1,379	755	625
Elm	4,758	-	2,080	1,298	1,380
Paper birch	800	-	598	174	28
Other soft hdwds.	1,290	-	708	308	274
Total	15,612	-	9,240	3,618	2,754
Hard hardwoods:					
White oak	2,749	-	1,675	722	352
Red oak	6,745	-	4,067	1,821	857
Yellow birch	1,890	-	734	546	610
Sugar maple	6,080	-	2,658	1,961	1,461
Beech	1,068	-	644	308	116
Other hard hdwds.	1,291	-	854	326	111
Total	19,823	-	10,632	5,684	3,507
Total hardwoods	35,435	-	19,872	9,302	6,261
All species	49,790	4,230	25,432	11,599	8,529

Table 21.--Volume of cull and dead timber and hardwood limbs on commercial forest land in the Lake States by state, January 1, 1953

(In million cubic-feet)

Class of material	Total	Michigan	Minnesota	Wisconsin
Cull trees:				
Sound	920	451	180	289
Rotten	2,355	778	1,073	504
Total	3,275	1,229	1,253	793
Hardwood limbs	1,667	717	443	507
Salvable dead trees	29	12	8	9
Total volume	4,971	1,958	1,704	1,309

Table 22.--Net annual growth of growing stock on commercial forest land in the Lake States by species and state, 1952

Species	Total		Michigan		Minnesota		Wisconsin	
	Million cu.-ft.	Million cords	Million cu.-ft.	Million cords	Million cu.-ft.	Million cords	Million cu.-ft.	Million cords
Eastern softwoods:								
White and red pine	55	0.7	21	0.3	15	0.2	19	0.2
Jack pine	84	1.1	49	0.6	15	0.2	20	0.3
Spruce	50	0.6	17	0.2	28	0.3	5	0.1
Balsam fir	72	0.9	24	0.3	38	0.5	10	0.1
Hemlock	10	0.1	6	0.1	-	-	4	1/
Tamarack	20	0.2	4	1/	13	0.2	3	1/
Cedar	28	0.4	14	0.2	9	0.1	5	0.1
Total softwoods	319	4.0	135	1.7	118	1.5	66	0.8
Eastern hardwoods:								
Soft hardwoods:								
Soft maple	68	0.8	45	0.5	1	1/	22	0.3
Aspen	363	4.6	86	1.1	159	2.0	118	1.5
Basswood	34	0.4	7	0.1	13	0.1	14	0.2
Elm	53	0.7	29	0.4	12	0.2	12	0.1
Paper birch	41	0.5	8	0.1	25	0.3	8	0.1
Other soft hardwoods	62	0.7	27	0.3	16	0.2	19	0.2
Total	621	7.7	202	2.5	226	2.8	193	2.4
Hard hardwoods:								
White oak	40	0.5	16	0.2	12	0.1	12	0.2
Red oak	108	1.3	25	0.3	17	0.2	66	0.8
Yellow birch	8	0.1	5	0.1	2/	1/	3	1/
Sugar maple	63	0.8	39	0.4	6	0.1	18	0.3
Beech	6	0.1	6	0.1	-	-	2/	1/
Other hard hardwoods	15	0.2	5	0.1	6	0.1	4	1/
Total	240	3.0	96	1.2	41	0.5	103	1.3
Total hardwoods	861	10.7	298	3.7	267	3.3	296	3.7
All species	1,180	14.7	433	5.4	385	4.8	362	4.5

1/ Less than 50,000 cords.
2/ Less than 500,000 cubic-feet.

Table 23.--Net annual growth of live sawtimber on commercial forest land in the Lake States by species and state, 1952

(n million board-feet)

Species	Total	Michigan	Minnesota	Wisconsin
Eastern softwoods:				
White and red pine	225	86	67	72
Jack pine	192	52	84	56
Spruce	101	37	58	6
Balsam fir	147	51	78	18
Hemlock	38	21	-	17
Tamarack	37	6	22	9
Cedar	62	34	19	9
Total softwoods	802	287	328	187
Eastern hardwoods:				
Soft hardwoods:				
Soft maple	115	74	1	40
Aspen	656	200	192	264
Basswood	114	31	42	41
Elm	190	94	47	49
Paper birch	69	32	24	13
Other soft hardwoods	95	37	31	27
Total	1,239	468	337	434
Hard hardwoods:				
White oak	119	41	38	40
Red oak	320	86	59	175
Yellow birch	24	15	1	8
Sugar maple	124	78	9	37
Beech	11	10	-	1
Other hard hardwoods	54	25	16	13
Total	652	255	123	274
Total hardwoods	1,891	723	460	708
All species	2,693	1,010	788	895

Table 24.--Annual mortality of growing stock and sawtimber on commercial forest land in the Lake States by state and softwoods and hardwoods, 1952

Class of material	Total	Michigan	Minnesota	Wisconsin
Growing stock: (Million cu-ft.)				
Softwoods	122	24	68	30
Hardwoods	363	112	105	146
Total	485	136	173	176
Sawtimber: (Million bd.-ft.)				
Softwoods	209	61	88	60
Hardwoods	489	217	106	166
Total	698	278	194	226

Table 25.--Annual mortality of growing stock on commercial forest land in the Lake States by causes and state, 1952

(In million cubic-feet)

Cause	Total	Michigan	Minnesota	Wisconsin
Fire	2	1	1	1/
Insects	34	13	14	7
Disease	166	43	69	54
Other	283	79	89	115
All causes	485	136	173	176

1/ Less than one-half million.

Table 26.--Annual mortality of sawtimber on commercial forest land in the Lake States by causes and state, 1952

(In million board-feet)

Cause	Total	Michigan	Minnesota	Wisconsin
Fire	3	1	2	1/
Insects	20	7	11	2
Disease	193	63	68	62
Other	482	207	113	162
Total	698	278	194	226

1/ Less than one-half million.

Table 27.--Annual mortality of growing stock and sawtimber on commercial forest land in the Lake States by causes, 1952

Cause	All growing stock	Sawtimber
	Million cu.-ft.	Million bd.-ft.
Fire	2	3
Insects:		
Bark beetles	-	-
Defoliators	1	2
Other	33	18
Total	34	20
Diseases:		
Stem diseases	117	88
Systemic diseases	11	31
Other	38	74
Total	166	193
Other:		
Weather	92	310
Animals	9	42
Miscellaneous	182	130
Total	283	482
All causes	485	698

Table 28.--Timber products output from roundwood in the Lake States Region by product and sources of timber used, 1952

Product	Output		Equivalent in survey units[1]	Cut from growing stock			Obtained from nongrowing stock [2]
	Unit of measure	Quantity		Product alone	Logging residue	Total cut	
			Thousand cu.- ft.	Thousand cu.- ft.	Thousand cu.- ft.	Thousand cu.- ft.	Thousand cu.- ft.
All species:							
Sawlogs	Thousand BF	1,006,010	161,476	157,830	36,852	194,682	3,646
Veneer logs	Thousand BF	70,444	11,150	11,147	2,858	14,005	3
Cooperage logs	Thousand BF	1,450	236	236	62	298	-
Pulpwood cords	Cords	2,231,193	171,847	163,368	15,513	178,881	8,479
Fuelwood	Cords	4,749,470	258,148	103,660	802	104,462	154,488
Piling	Thousand linear ft.	673	472	472	162	634	-
Poles	Thousand pcs.	172	1,469	1,469	362	1,831	-
Posts	Thousand pcs.	25,380	19,036	14,554	1,802	16,356	4,482
Mine timbers	Thousand CF	6,688	6,688	5,473	1,261	6,734	1,215
Other	Thousand CF	25,949	19,449	15,873	3,414	19,287	3,576
Total			649,971	474,082	63,088	537,170	175,889
Softwoods only:							
Sawlogs	Thousand BF	290,400	48,207	47,482	8,139	55,621	725
Veneer logs	Thousand BF	339	59	59	14	73	-
Cooperage logs	Thousand BF	-	-	-	-	-	-
Pulpwood	Cords	1,395,344	108,627	100,787	8,059	108,846	7,840
Fuelwood	Cords	762,600	26,177	6,584	86	6,670	19,593
Piling	Thousand linear ft.	242	170	170	60	230	-
Poles	Thousand pcs.	172	1,469	1,469	362	1,831	-
Posts	Thousand pcs.	14,245	10,685	7,868	971	8,839	2,817
Mine timbers	Thousand CF	4,959	4,959	3,919	743	4,662	1,040
Other	Thousand CF	1,401	1,401	1,365	429	1,794	36
Total			201,754	169,703	18,863	188,566	32,051

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[1] Includes material from growing stock, nongrowing stock, and plant residues.

[2] Volume of timber products cut from nongrowing stock, i.e., cull trees and limbs, dead timber, trees of commercial species less than 5.0 inches in diameter, trees from noncommercial lands (fence rows, windbreaks, etc.). Excludes plant residue.

Table 29.--Timber products output[1/] in the Lake States by products, by softwood and hardwood, and by state, 1952

Product	Unit of measure	Total	Michigan	Minnesota	Wisconsin
Sawlogs for lumber:	Thousand bd.-ft.				
Softwood		290,400	108,650	98,800	82,950
Hardwood		715,610	374,010	92,450	249,150
Total		1,006,010	482,660	191,250	332,100
Veneer logs & bolts:	Thousand bd.-ft.				
Softwood		339	160	7	172
Hardwood		70,105	36,048	7,249	26,808
Total		70,444	36,208	7,256	26,980
Cooperage logs & bolts:	Thousand bd.-ft.				
Softwood		-	-	-	-
Hardwood		1,450	-	16	1,434
Total		1,450	-	16	1,434
Pulpwood:	Cords				
Softwood		1,395,344	455,627	662,367	277,350
Hardwood		835,849	289,001	258,915	287,933
Total		2,231,193	744,628	921,282	565,283
Fuelwood:	Cords				
Softwood		762,600	253,300	299,110	210,190
Hardwood		3,986,870	1,420,500	874,310	1,692,060
Total		4,749,470	1,673,800	1,173,420	1,902,250
Piling:	M linear ft.				
Softwood		242	26	216	-
Hardwood		431	272	-	159
Total		673	298	216	159
Poles:	Thousand pcs.				
Softwood		172	20	136	16
Hardwood		-	-	-	-
Total		172	20	136	16
Posts:	Thousand pcs.				
Softwood		14,245	7,310	2,425	4,510
Hardwood		11,135	2,145	3,775	5,215
Total		25,380	9,455	6,200	9,725
Mine timbers:	Thousand cu.-ft.				
Softwood		4,959	2,945	1,725	289
Hardwood		1,729	1,499	168	62
Total		6,688	4,444	1,893	351
Other:	Thousand cu.-ft.				
Softwood		1,401	712	370	319
Hardwood		24,548	16,664	2,266	5,618
Total		25,949	17,376	2,636	5,937

[1/] From roundwood and plant residue.

Table 30.--Timber cut from growing stock on commercial forest land in the Lake States by selected products, softwood and hardwood, and by state, 1952

(In thousand cubic-feet)

Product	Total	Michigan	Minnesota	Wisconsin
Sawlogs (for lumber, etc.):				
Softwood	55,621	20,808	18,920	15,893
Hardwood	139,061	71,412	18,855	48,794
Total	194,682	92,220	37,775	64,687
Pulpwood:				
Softwood	108,846	35,568	51,665	21,613
Hardwood	70,035	24,151	21,634	24,250
Total	178,881	59,719	73,299	45,863
Veneer logs & bolts:				
Softwood	73	34	1	38
Hardwood	13,932	7,167	1,437	5,328
Total	14,005	7,201	1,438	5,366
Other products:				
Softwood	24,026	10,635	7,925	5,466
Hardwood	125,576	45,735	27,674	52,167
Total	149,602	56,370	35,599	57,633
All products:				
Softwood	188,566	67,045	78,511	43,010
Hardwood	348,604	148,465	69,600	130,539
Total	537,170	215,510	148,111	173,549

Table 31.--Timber cut from live sawtimber on commercial forest land in the Lake States by selected products, softwood and hardwood, and by state, 1952

(In thousand board-feet)

Product	Total	Michigan	Minnesota	Wisconsin
Sawlogs (for lumber, etc.):				
Softwood	249,167	93,222	84,771	71,174
Hardwood	593,142	325,888	65,477	201,777
Total	842,309	419,110	150,248	272,951
Pulpwood:				
Softwood	97,684	46,113	25,833	25,738
Hardwood	30,156	10,398	9,316	10,442
Total	127,840	56,511	35,149	36,180
Veneer logs & bolts:				
Softwood	403	190	8	205
Hardwood	81,012	41,671	8,367	30,974
Total	81,415	41,861	8,375	31,179
Other products:				
Softwood	36,705	16,312	13,876	6,517
Hardwood	152,138	60,597	34,744	56,797
Total	188,843	76,909	48,620	63,314
All products:				
Softwood	383,959	155,837	124,488	103,634
Hardwood	856,448	438,554	117,904	299,990
Total	1,240,407	594,391	242,392	403,624

Table 32.--Timber cut from growing stock on commercial forest land in the Lake States by species and state, 1952

(In thousand cubic-feet)

Species	Total	Michigan	Minnesota	Wisconsin
Eastern softwoods:				
White pine	12,133	3,128	4,542	4,463
Red pine	9,553	1,081	5,691	2,781
Jack pine	42,536	7,077	25,920	9,539
Spruce	36,998	10,165	23,625	3,208
Balsam fir	31,607	12,139	13,407	6,061
Hemlock	37,450	24,601	-	12,849
Tamarack	4,714	1,283	2,525	906
Cedar	13,575	7,571	2,801	3,203
Total softwoods	188,566	67,045	78,511	43,010
Eastern hardwoods:				
Sugar maple	54,630	36,960	349	17,321
Soft maple	17,731	11,305	445	5,981
Birch	27,782	15,253	3,259	9,270
Basswood	13,621	3,826	3,309	6,486
Beech	10,081	9,686	-	395
Elm	24,923	12,249	3,882	8,792
Oak	59,041	16,766	11,067	31,208
Aspen	127,995	38,017	42,785	47,193
Other hardwoods	12,800	4,403	4,504	3,893
Total hardwoods	348,604	148,465	69,600	130,539
All species	537,170	215,510	148,111	173,549

Table 33.--Timber cut from sawtimber on commercial forest land in the Lake States by species and state, 1952

(In thousand board-feet)

Species	Total	Michigan	Minnesota	Wisconsin
Eastern softwoods:				
White pine	50,797	12,530	19,434	18,833
Red pine	39,525	4,280	23,894	11,351
Jack pine	71,710	13,022	47,440	11,248
Spruce	24,642	7,706	14,653	2,283
Balsam fir	19,149	6,690	8,875	3,584
Hemlock	145,188	95,229	-	49,959
Tamarack	8,416	3,219	3,640	1,557
Cedar	24,532	13,161	6,552	4,819
Total softwoods	383,959	155,837	124,488	103,634
Eastern hardwoods:				
Sugar maple	206,703	145,126	1,557	60,020
Soft maple	64,316	46,403	1,133	16,780
Birch	92,435	58,438	8,567	25,430
Basswood	59,400	18,190	13,404	27,806
Beech	35,036	33,643	-	1,393
Elm	83,721	38,604	11,684	33,433
Oak	157,274	52,764	26,943	77,567
Aspen	120,492	30,722	43,971	45,799
Other hardwoods	37,071	14,664	10,645	11,762
Total hardwoods	856,448	438,554	117,904	299,990
All species	1,240,407	594,391	242,392	403,624

Table 34.--Volume of plant residues from primary manufacturing in the Lake States region--quantities produced, used, and unused, 1952

(In thousand cubic-feet)

Industry and type of residue[1]	Produced	Used				Unused
		Fuel	Fiber	Other[2]	Total	
Lumber:						
Coarse	40,809	30,260	804	5,390	36,454	4,355
Fine	33,500	10,084	-	6,681	16,765	16,735
Total	74,309	40,344	804	12,071	53,219	21,090
Veneer:						
Coarse	1,907	711	70	1,110	1,891	16
Fine	3,003	2,818	-	35	2,853	150
Total	4,910	3,529	70	1,145	4,744	166
Cooperage:						
Coarse	94	94	-	-	94	-
Fine	158	79	-	35	114	44
Total	252	173	-	35	208	44
Pulp:						
Coarse	15,030	15,030	-	-	15,030	-
Fine	10,680	10,680	-	-	10,680	-
Total	25,710	25,710	-	-	25,710	-
Other:[3]						
Coarse	2,940	2,790	-	-	2,790	150
Fine	1,673	1,409	-	61	1,470	203
Total	4,613	4,199	-	61	4,260	353
All industries:						
Coarse	60,780	48,885	874	6,500	56,259	4,521
Fine	49,014	25,070	-	6,812	31,882	17,132
Total	109,794	73,955	874	13,312	88,141	21,653

1/ Coarse plant residues include slabs, edging, trimming, miscuts, veneer cores, cull pieces and other material generally suitable for chipping. Fine plant residues include sawdust, shavings, veneer clippings, wood substance removed in barking, screenings and other material generally too small for chipping.

2/ Includes material for outstock, handles, bench blocks, chemical wool, box board, particle board, floor cleaning compound, wood flour, insulation bedding for livestock, poultry litter, soil conditioner, metallurgy and other similar purposes.

3/ Includes shingle and lath mills; small dimension, turnery, and excelsior plants; and other similar establishments utilizing roundwood.

Table 35.--Volume of unused logging and plant residues[1] from primary manufacturing in the Lake States by industry source and type of material, 1952

(In thousand cubic-feet)

Industry	All unused residue			Logging residue		Unused plant residue		
	Total	Coarse	Fine	Total	Coarse	Total	Coarse	Fine
Lumber	57,942	41,207	16,735	36,852	36,852	21,090	4,355	16,735
Veneer	3,024	2,874	150	2,858	2,858	166	16	150
Cooperage	106	62	44	62	62	44	-	44
Pulp	15,513	15,513	-	15,513	15,513	-	-	-
Other	8,156	7,953	203	7,803	7,803	353	150	203
All industries	84,741	67,609	17,132	63,088	63,088	21,653	4,521	17,132

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[1] Coarse plant residues include slabs, edging, trimming, miscuts, veneer cores, cull pieces and other material generally suitable for chipping. Fine plant residues include sawdust, shavings, veneer clippings, wood substance removed in barking, screenings and other material generally too small for chipping.

Table 33.--Area of acceptable forest plantations in the Lake States by ownership class and state, June 30, 1952

(In thousand acres)

Ownership or trusteeship	Total	Michigan	Minnesota	Wisconsin
Commercial forest land:				
Federal:				
National forest	638.0	376.0	96.0	166.0
Other federal	14.0	4.2	4.7	5.1
Total	652.0	380.2	100.7	171.1
State	338.4	268.0	33.4	37.0
County and municipal	124.9	10.0	3.9	111.0
Private	276.0	93.0	62.0	121.0
Total commercial	1,391.3	751.2	200.0	440.1
Noncommercial forest land:				
Federal:				
National forest	-	-	-	-
Other federal	7.8	3.8	.7	3.3
Total	7.8	3.8	.7	3.3
State	-	-	-	-
County and municipal	-	-	-	-
Private	2.0	1.0	-	1.0
Total noncommercial	9.8	4.8	.7	4.3
Shelterbelts (all private)	22.5	5.0	11.5	6.0
Total all land	1,423.6	761.0	212.2	450.4

Table 37.--Plantable area of commercial and noncommercial forest land in the Lake States by ownership class and state, January 1, 1953

(In thousand acres)

Ownership or trusteeship	Total	Michigan	Minnesota	Wisconsin
Commercial forest land:				
Federal:				
National forest	404	245	96	63
Other federal	33	1	15	17
Total	437	246	111	80
State	1,350	250	200	63
County and municipal	610	50	400	347
Private	5,254	2,324	1,550	2,030
Total commercial	7,651	2,870	2,261	2,520
Noncommercial forest land:				
Federal:				
National forest	50	25	-	25
Other federal	-	-	-	-
Total	50	25	-	25
State	100	35	30	35
County and municipal	90	30	30	30
Private	396	166	100	130
Total noncommercial	636	256	160	220
Shelterbelts (all private)	200	50	100	50
Total all land	8,487	3,176	2,521	2,790

APPENDIX--DEFINITION OF TERMS

Acceptable plantation.--A plantation that has at least 400 planted forest trees per plantation acre at the end of the fifth year after planting.

Cull trees.--Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect, rot or species.

> Sound cull trees.--Live trees of sawtimber or poletimber size that meet regional specifications of freedom from rot, but will not make at least one merchantable sawlog now or prospectively according to regional specifications because of roughness, poor form, or species.
>
> Rotten cull trees.--Live trees of sawtimber or poletimber size which fail to meet regional specifications of proportion of sound volume to total volume.

Diameter classes.--A classification of trees based on diameter of the bole, outside bark, measured at breast height (4½ feet above the ground). D.b.h. is the common abbreviation for "diameter at breast height." Two-inch diameter classes, of which the even inch is the approximate midpoint, are used. For example, the 6-inch class includes trees 5.0 to 6.9 inches d.b.h., the 12-inch class includes trees 11.0 to 12.9 inches d.b.h.

Forest land area.--Includes (a) lands which are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b)land from which the trees described in (a) have been removed to less than 10 percent stocking and which have not been developed for other use; (c) afforested areas. Does not include orchard land. The minimum area that qualifies as forest land is one acre. Roadside, streamside, and shelterbelt strips of timber, in addition to meeting above requirements, must be at least 120 feet wide to qualify as forest land.

> Commercial forest land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Reserved forest land area.--Productive or unproductive public forest land set aside by statute, ordinance or administrative order for parks, monuments, wilderness areas, and other special uses.

Unproductive forest land area.--Forest land incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future. (Unproductive forest land area includes lands that are productive in grazing, watershed, recreational and wildlife uses.)

Forest type groups.--A classification of forest areas based upon the predominant species composition of the present tree cover.

Growing stock.--Net volume in cubic feet of live sawtimber trees and live poletimber trees from stump to a minimum 4-inch top (of central stem) inside bark. The volume of this material is also measured in standard cords, outside bark.

Growth

Net annual growth of sawtimber.--The change during a specified year in net board-foot volume of live sawtimber resulting from natural causes exclusive of catastrophic losses.

Net annual growth of growing stock.--The change during a specified year in net cubic-foot volume of growing stock resulting from natural causes exclusive of catastrophic losses.

Hardwood limbs.--The limbs of live sawtimber hardwood trees and sawtimber size cull hardwood trees to a minimum diameter of 4.0 inches inside bark.

Land area.--Includes dry land and land temporarily or partially covered by water, such as marsh lands, swamps, and river flood plains (omitting tidal flats); streams, sloughs, estuaries, and canals less than one-eighth of a statute mile in width; and lakes, reservoirs, and ponds having less than 40 acres of area.

Live sawtimber volume.--Net volume in board-feet International 1/4-inch rule, of live sawtimber trees of commercial species.

Logging residues

Logging residues from live sawtimber.--The net board-foot volume of live sawtimber trees cut or killed by logging and not converted to timber products.

Logging residues from growing stock.--The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging and not converted to timber products. Also given in standard cords.

Mortality

Annual mortality of sawtimber.--The average annual net board-foot volume removed from live sawtimber during a specified period through death from natural causes, exclusive of catastrophic losses.

Annual mortality of growing stock.--The average annual net cubic-foot volume removed from growing stock during a specified period through death from natural causes, exclusive of catastrophic losses. Also given in standard cords.

Net volume

Net volume in board feet.--Gross volume in terms of the International 1/4-inch log rule less deductions for rot, sweep, and other defects affecting use for lumber.

Net volume in cubic feet.--Gross volume in cubic feet less deductions for rot.

Plant residues.--Slabs, edgings, trimmings, miscuts, cull pieces, veneer cores, sawdust, shavings, wood substance lost in barking, chipper rejects and screenings at pulp mills, veneer clippings, and other residues developed from logs, bolts and other round timber in the primary manufacturing process, excluding lignin and various dissolved wood substances incurred in pulp manufacture.

Plantable area.--Nonstocked or poorly stocked forest land or nonforest land (a) on which the establishment or interplanting of forest tree cover is desirable and practical, and (b) on which forest tree regeneration will not occur naturally in desirable density within a reasonable period of time.

Roundwood.-- The cubic volume of logs, bolts, and other round sections as they are cut from the tree.

Salvable dead trees.--Standing or down dead trees that are considered merchantable by regional standards.

Sawlog portion.--The portion of sawtimber trees between stump and merchantable top.

Stand-size class

Sawtimber stands.--Stands of sawtimber trees having a minimum net volume per acre of 1,500 board-feet, International 1/4-inch rule.

Poletimber stands.--Stands failing to meet the sawtimber stand specifications, but at least 10 percent stocked with poletimber and larger trees and with at least half this minimum stocking in poletimber trees.

Seedling and sapling stands.--Stands not qualifying as sawtimber or poletimber stands, but at least 10 percent stocked with trees and with at least half this minimum stocking in seedlings or saplings.

Nonstocked and other areas.--Areas not qualifying as sawtimber, poletimber, or seedling and sapling stands.

Stocking.--Stocking is the extent to which growing space is effectively utilized by present or potential growing stock trees of commercial species. Degree of stocking is synonymous with "percent of growing space occupied" and means the ratio of actual stocking to full stocking for comparable sites and stands. Stocking may be measured in terms of number of trees, volume, basal area, cover canopy, or other criterion, or combination of criteria.

Nonstocked areas.--Areas that are 0 to 10 percent stocked with present or potential growing stock trees.

Poorly stocked stands.--Stands that are 10-39 percent stocked with present or potential growing stock trees.

Well and medium stocked stands.--Stands that are 40 percent or more stocked with present or potential growing stock trees.

Timber cut

Timber cut from live sawtimber.--The net board-foot volume of live sawtimber trees cut or killed by logging during a specified year, including logging residue.

Timber cut from growing stock.--The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging during a specified year, including logging residue. Also given in standard cords.

Timber products output.--The volume of timber products cut from growing stock on commercial forest land and from other sources such as cull trees, salvable dead trees, limbs, saplings, material less than 4 inches in diameter, timber on noncommercial and nonforest lands, and plant residues. Timber products include sawlogs, veneer logs and bolts, cooperage logs and bolts, pulpwood, fuelwood, piling, poles, posts, hewn ties, mine timbers, and various other round, split, or hewn products.

Tree-size class.--Any one of the following tree classes in which the trees are grouped chiefly according to diameter at breast height (4-1/2 feet above the ground), outside bark:

Sawtimber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and that are of the following minimum diameters at breast height:

Eastern regions: Softwoods 9.0 inches

Hardwoods 11.0 inches

Poletimber trees.--Trees of commercial species that meet regional specifications of soundness and form, and that are of the following diameters at breast height:

Eastern regions: Softwoods 5.0 to 8.9 inches

Hardwoods 5.0 to 10.9 inches

Seedling and sapling trees.--Live trees of commercial species, less than 5.0 inches in diameter at breast height, and of good form and vigor.

Upper stem portion (sawtimber trees).--The portion of sawtimber trees between merchantable top and a point on the bole with a minimum top 4.0 inches in diameter inside bark when it exists.